AMENDMENTS TO THE CLAIMS

Claims 1-86 (Canceled)

87. (New) A method for assessing at least one quality parameter or at least one quantity parameter of a particle in a liquid material, said liquid material comprising particles having bound thereto or comprised therein at least one species of analytes in an amount of less than $1x10^6$ analyte detectable positions,

comprising:

mixing the liquid material with at least one reagent material, said reagent material at least comprising a first targeting species capable of selectively and directly binding to an analyte position of said species of analytes and a labelling agent, wherein said labelling agent is a compound capable of emitting, absorbing, attenuating or scattering electromagnetic radiation to result in the generation of a detectable electromagnetic signal, wherein the first targeting species and the labelling agent are directly or indirectly coupled to each other,

arranging a volume of a liquid material comprising at least part of the mixture of the liquid material and the reagent material in a sample compartment having a wall part defining an exposing area, the wall part allowing electromagnetic signals from the sample in the compartment to pass through the wall to the exterior,

exposing, onto an array of active detection elements, a representation of electromagnetic signals having passed through the wall part from the sample in the sample compartment, wherein the representation is subject to a linear enlargement, so that the ratio of the image of a linear dimension on the array of detection elements to the original linear dimension in the exposing domain is smaller than 20:1,

detecting the representation as intensities by individual active detection elements,

processing the intensities in order to identify representations of electromagnetic signals from the particles as distinct from representations of electromagnetic signals from background, and

obtaining the at least one quality parameter or at least one quantity parameter from the result of the processing.

88. (New) The method according to claim 87, wherein the particle is selected from cells, cell walls, bacteria, plasmodia, virus, prions, or fragments or clusters thereof, and macromolecules and beads.

89. (New) The method according to claim 88, whereby the particle is a bead, to which analytes are bound.

90. (New) The method according to claim 87, whereby the analyte is selected from proteins, polypeptides, peptides, lipids, carbohydrates, lipoproteins, carbohydrate-conjugated proteins, membrane constituents, receptors, genes, DNA, RNA, or fragments or clusters thereof.

91. (New) The method according to claim 88, whereby the analyte is bound to a cell membrane or cell nucleus membrane, such as whereby the analyte is a cell receptor.

92. (New) The method according to claim 88, whereby the analyte is comprised in a cell.

93. (New) The method according to claim 92, whereby the analyte is comprised inside an organelle.

94. (New) The method according to claim 92, whereby the analyte is located on the surface of an organelle.

95. (New) The method according to claim 87, whereby the particles have bound thereto or comprised therein at least one species of analytes in an amount of less than $5x10^5$ analyte detectable positions.

96. (New) The method according to claim 87, whereby the particles have between 500 and 50,000 analyte detectable positions (average for population).

97. (New) The method according to claim 87, wherein the cells are selected from mammalian cells, insect cells, reptile cells, fish cells, yeast cells, and fungi cells.

98. (New) The method according to claim 87, wherein the cells are selected from blood cells, sperm cells, and bone marrow cells.

99. (New) The method according to claim 87, whereby the liquid material comprises at least two different species of particles.

100. (New) The method according to claim 99, whereby only one of the species of particles has bound thereto or comprised therein the species of analyte.

101. (New) The method according to claim 87, comprising binding at least two distinct targeting species to at least two distinct species of analyte and labelling the at least two distinct targeting species with two distinct labelling agents.

102. (New) The method according to claim 87, whereby one species of analyte is selected from CD (Cluster of Differentiation) markers, such as CD3, CD4, CD8, CD16, CD19, CD22, CD34, CD45, CD61, and CD91, Epithelial Membrane Antigen (EMA), Estrogen receptor α (ERα), Cytokeratin Human, Cytokeratin 7, Cytokeratin 20, Ki-67/PI, Phosphatidylserine, BCL2 Oncoprotein, suPAR (soluble urokinase Plasminogen Activator Receptor), urokinase, a hormone bound to a receptor, a cell cycle related protein, a marker of apoptosis, and Green fluorescent protein (GFP).

103. (New) The method according to claim 87, whereby one species of analyte is selected from a chromosomal DNA sequence, a mitochondrial DNA sequence, a chloroplast DNA sequence, a mRNA sequence, a rRNA sequence, a nucleotide sequence comprising a single nucleotide polymorphism.

104. (New) The method according to claim 87, whereby one species of analyte is a cell cycle related protein, e.g. cycline (such as cyclin D1), tumor suppresser protein (e.g. p53

protein), Epidermal Growth Factor protein (EGF protein), Transforming Growth Factor beta (TGF-beta1), Ki-67 protein.

105. (New) The method according to claim 87, whereby the analyte is a cell cycle related protein receptor such as Epidermal Growth Factor Receptor (EGFR), Cyclin Dependent Kinases (e.g. CDK4).

106. (New) The method according to claim 87, whereby one species of analyte is a marker of apoptosis, e.g. membrane bound phosphatidylserines, phosphatidylserines targeted with Annexin V, BCL2 oncoprotein.

107. (New) The method according to claim 87, whereby the at least one species of analyte is a medical marker of a disease.

108. (New) The method according to claim 87, whereby the reagent material comprises more than one first targeting species, each of said targeting species being directed to a different analyte.

109. (New) The method according to claim 87, whereby the targeting species is an antibody directed to the analyte species.

110. (New) The method according to claim 87, whereby the targeting species is a nucleotide probe complementary to a sequence of an analyte species.

111. (New) The method according to claim 87, whereby the targeting species is an in situ hybridisation (ISH) probe.

112. (New) The method according to claim 87, wherein the liquid material is selected from body fluids, such as blood, urine, saliva, bile, sperm, faeces, cerebro-spinal fluid, nasal secrete, tears, bone marrow, and milk, milk products, waste water, process water drinking water, food, feed, and mixtures, dilutions, or extracts thereof.

113. (New) The method according to claim 87, wherein the labelling agent is selected from fluorescently labelled antibodies and antibodies labelled with reactive molecules.

114. (New) The method according to claim 87, wherein the labelling agent is selected from fluorescently labelled nucleotide probes and nucleotide probes labelled with reactive molecules.

115. (New) The method according to claim 87, wherein the reagent material further comprises lysing agents and tissue fixative agents.

116. (New) The method according to claim 87, wherein the reagent material further comprises fluorescence quenching agents, light absorbing agents, fluorescence amplification agents (e.g. fluorescyl-tyramine, Cy3-tyramine).

117. (New) The method according to claim 87, whereby the labelling agent is selected from agents giving rise to one or several of the following phenomena: attenuation of electromagnetic radiation, photoluminescence when illuminated with electromagnetic radiation, scatter of electromagnetic radiation, raman scatter.

118. (New) The method according to claim 117, whereby the labelling agent is selected from fluorescein (FITC), phycoerythrin, (RPE or PE), cyanine dyes (Cy dyes), Cy3, Cy5, Cy5.5, allophycocyanines (APC), indotrimethinecyanines, indopentamethinecyanines, acridine orange, thiazole orange, DAPI, propidium iodide (PI), ethidium iodide, 7-aminoactinomycin D, Per CP or chemically coupled combinations thereof.

119. (New) The method according to claim 87, whereby the recording of image comprises the use of a confocal scanner.

120. (New) The method according to claim 87, whereby the image is recorded using an array of detection devices.

121. (New) The method according to claim 87, wherein the image is recorded using a CCD, a CMOS, a video camera or a photon counting camera.

122. (New) The method according to claim 87, whereby the image is recorded without enlargement.

123. (New) The method according to claim 87, whereby the enlargement ratio is below 10, more preferably below 5, such as 4, more preferably below 4 such as 2, more preferably below 2, such as 1.

124. (New) The method according to claim 87 whereby the image is recorded in one exposure.

125. (New) The method according to claim 87 whereby the image is recorded in two, three or more exposures.

126. (New) The method according to claim 125, wherein the assessment of the number of particles is obtained on the basis of more than one image, preferably two images, more preferably more than two images, more preferably more than four images.

127. (New) The method according to claim 125, where information about the changes in the image in course of time is used in the assessment of the number of particles.

128. (New) The method according to claim 87, whereby a distinction between at least two spectral properties of a labelling agent is used to obtain the at least one quality parameter or at least one quantity parameter of the particles.

129. (New) The method according to claim 87, whereby the recording of an image further comprises exposing a first surface of the sample directly with excitation light from a first

light means having at least a first light source, by use of focusing means detecting a fluorescence signal from the first surface of the sample onto a first detection means comprising at least a first detector.